The JOURNAL of the AMERICAN DENTAL HYGIENISTS' ASSOCIATION

VOL. 12 OCTOBER, 1938 No. 4

OFFICIAL CALL TO THE CONVENTION

St. Louis, Missouri is to be our hostess city for the Fifteenth Annual Convention of the American Dental Hygienists' Association.

October 24-28, 1938.

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Rates	Single Room	$2—$2.50—$3.00
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Leisure time for sightseeing.

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President American Dental Hygienists' Association.

The JOURNAL

of the AMERICAN DENTAL HYGIENISTS' ASSOCIATION

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Volume 12 OCTOBER, 1938 Number 4

CONTENTS

Mottled Teeth in Children 3
By Dr W. C. Graham, Ohio State University
Editorial 9
Committees of American Dental Hygienists' Association 14
Diet and its Effect Upon Blood Formation 18
By Dr. Frieda S. Robbins, Pathological Dept. School of Medicine, Rochester University
Some Problems of the Child Patient in General Practice 25
By Eugene Veasey, D.D.S., Wilmington, Del
Endocrinology 28
By Juliana G. Swiney, M.D., New York City
Program of Dental Division Phila. State Dept. of Health 34
By Dr. Milton J. Waas, Chief, Dental Division
Vacations 37
By Thelma Meyers, R.D.H., Cleveland, Ohio
Porcelain Inlay Technique Without the Use of a Platinum Matrix 39
By Jane Rosecrans, R.D.H., Chicago, Ill.
Lesson on Dental Anatomy and Tooth Decay 42
By Harriet M. Fitzgerald. A. B., Berkeley, Calif.
Bridgeport High School Plan 44
By Mabel McCarthy, R.D.H., Bridgeport, Conn.

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Mottled Teeth in Children

BY DR. W. C. GRAHAM
Ohio State University

IN presenting this refresher program we are at a loss to know just what is refreshing. Why a refresher? The very statement says that there was knowledge on the subject at one time, but in the stress and turmoil of life some facts have been overlooked, forgotten, neglected and are to be called to mind again.

This has always been the case. I doubt not but that there is virtue in a program which would require the professional service vocations to go every 5 years and take what we are calling today a refresher course, or postgraduate course, and brush up on forgotten or neglected procedures.

Today we are centralizing our thoughts around the child, and we ask "have we been as thoughtful of the child as we should have been".

Yes, the Hindu Mother fed her babes to the crocodiles along the banks of the Ganges River. Have we been feeding our babies to the diarrheas and mouth infections so prevalent in so many homes? "If I can get my child through the second summer, I may be able to raise him", wails the heartbroken mother as she watches it grow thin and pale, through the dog days with the heat and flies, and the diarrheas and the cutting of the deciduous molars, all these reaching out for the little life. She may succeed and she may not.

No brighter pages have been written in the Healing Art than those telling the progress made by the pediatrician in solving the problem of infant nutrition and the ability to utilize the food offered. It is the story of years of ceaseless toil of men working in pediatric clinics, and children's dental clinics all over the world. It is a record of interchange of knowledge of ideas, methods, and experiences of a group of workers in Germany, France, America, Italy and Austria, a group of Crusaders waging a war to save babies. Failures light the fires of greater hopes and firmer determination to win.

Pasteur, Koch, Lister paved the way to great triumphs in surgery by proving that bacterial invasion was the causative factor in surgical deaths. It might be that the bacterial invasion is what is killing our babies.

When Von Beharing proved that he has solved the cause of diphtheria a shout of joy rang out through the world, second only to the shout of joy that a Christ was born. Bearded men of science, with faces seamed and scarred from the fights with death to conquer this disease, wept like children when this great discovery was made known in Germany.

Then Koch proved that tubercle bacillus was the cause of another disease, which had, and still claims far too many, but these two enemies of childhood were put into chains. The feeding problem is yet unsolved. Still the undernourished bodies of children, growing thinner and thinner, and the diarrheas and infections carry the babes to the crocodiles along the banks of the Ganges of neglect and ignorance.

Biochemistry is still one of the frontiers of the Healing Art. The cell and its mysterious protoplasm still keeps locked within itself the supreme

secret. What is life? Growth and nutrition? Men of science with test tubes and microscopes are working devotedly, relentlessly to find out the unknown, but the mystery remains. Workers come and go. The young have grown old in the attack, have died and been forgotten, but others take up the weapons of warfare and fight on. Today we have recruits more carefully trained than any that has yet taken up the fight. Hope lures and ambition beckons on that an answer will be found.

Where does life begin still urges the scientist on and on. We can trace the footprints of disease in the blackened ruins it leaves behind, but where does life begin? What lights the spark? What starts the wheels of life? Growth does not just happen. Decay does not just begin. Of this field of biochemistry and its handmade physiology, here is our frontier field. On these two we must build our foundations.

The trend today is studying the living rather than the dead. Yes, to study function rather than decay. The biopsy and postmortem have their places and valuable lessons are by them revealed, but it would have been better to prevent death. Better prevent crime than to track down the criminal. Beautiful surgical operations thrill the eye, but it saddens the heart to know that the condition of the patient will be no better after the operation, or perchance worse because the restoration of the function was overlooked. The growing child is far more important than the dead one. Nutrition and growth must be studied through biochemistry, rather than clinically. Feed the child properly and the problem of raising the baby and keeping it healthy will disappear. And we are finding out how to feed the child better and better. Study the chart of infant mortality. See how the number of deaths decrease each year. Is this not reason for joy, to know that we are saving in Ohio each year almost 1000 more than the year before. And this is my message to you today:

Save the babies of Ohio.

Do your bit to furnish the babies in your practice with a chewing mechanism that will assist in nutrition, that in years to come he will transmit to his or her progeny a well nourished body. Save the babies of today so that their children, grandchildren and great-grandchildren will live with healthy bodies and will bless you for it.

A phase of this care for children challenges our attention. A phase of which we heard very little until a very recent time, and it is: MOTTLED TEETH.

Mottled enamel has an interesting story. While the earliest records concerning this condition were written by a member of the U. S. Public Health Service stationed at Naples, Italy, which appeared in 1901. It was not until 1916 that it was reported in America by G. B. Black and Frederick S. McKay which report was published in the Dental Cosmos. This was the first actual study and publication of the enamel defect, and which they called Mottled Enamel, or to be specific is called Chronic Endermic Dental Fluerosis.

The most essential injury is the appearance of the teeth. While they are of normal form, they are not of normal color. This discrepancy in color ranges from an opaque white through the yellows, browns to black. It is claimed that the cementing substance between the enamel rods in the

outer fourth, more or less, is absent. The teeth generally affected is the labial surface of the upper incisors and cuspids, but frequently we note spots on the molors. Rarely are the deciduous teeth affected, which might indicate that it is of post-natal origin.

It is claimed that the typical brown color cannot occur unless the enamel bears the fundamental mottled effect, and the color appears after the mottled teeth have erupted. We have been prone to think that the color is inalienable, but the best researches seem to affirm that the fundamental effect is congenital, but that the color is acquired after eruption.

Noyes in his Dental Histology says, "The enamel rods and the cementing substance have a different origin, or at least formed by different cells, and that pathosal conditions may prevent the formation of one and not the other".

Black believes that the enamel rods were themselves intact and normal of form, but the cementing substance only absent. J. Leon Williams believed that in some cases, at least, the rods themselves were diminished in contour.

The geographical distribution is widely scattered as the condition has been observed in approximately 300 areas, and even in our United States, there are 23 states which have reported it, 16 of which are west of the Mississippi River.

It was believed at first that water-borne disease of endemic proportions was due to pathogenic bacteria or other organisms, but it is now fully established that the element fluorine combined as a fluoride, when present in a water supply in excess of 1.0 p.p.m. effects the teeth of growing children.

When we realize that every child born and reared in an endemic area is practically certain to have this disfigurement in some degree, we then realize it is a problem worthy of solution.

Our greatest interest, perhaps, in Mottled Teeth is the relationship of this situation to dental caries. Although if this defect of enamel-development were considered only in the light of its baffling and almost mystical origin, it would of itself be well worthwhile and challenge our devout study, but taken in the significance to caries, it throws a flood of illuminating evidence upon some of the most important phases in dental science and especially upon that part of dental science concerned with tooth development and tooth decay in the unborn and childhood.

There are two viewpoints accounting for dental caries, and strange to say they are in direct juxtaposition to each other. The older of these two viewpoints is that which maintains that the determinng factor in the causation of caries rests within the tooth itself and depends upon the excellence of calcification or the calcific integrity of the enamel itself. This same idea is contained within the expression "vital resistance", which is frequently used.

But there arises the question "can there be any such biological process within the enamel as "vital resistance"?

The other viewpoint is the claim that the oral environment, or a combination of factors, is the answer to the carious tooth and that the tooth is

a passive factor. Dr. Kirk once told we students that "In some months any tooth will decay and in other months no tooth will decay" and this he claimed was regardless of the integrity of the enamel.

The study of so-called Mottled enamel has thrown some very interesting side light on the controversy and particularly upon that viewpoint which is based upon the character of the tooth itself.

What is meant when we say a tooth is poorly calcified? Well, one of two things immediately comes to mind, first, that the enamel rods themselves are inferor in their lime content, or that the cementing substance between the rods is inferior. Then to determine which is the case is the question at issue. Genuine progress in dentistry is dependent upon exact knowledge of the cause of dental caries. Preventive dentistry is first concerned with studies of etiology. Certainly this cannot be decided clinically by the resistance which enamel presents to the cutting instrument.

Excepting such gross defects as "atrophy" Mottled enamel is, from the viewpoint of calcification, the worst and poorest enamel of which we have any knowledge, and yet its susceptibility to caries is no greater than what is generally known as normal dentine, in fact, there is a curious absence of decay in Mottled teeth if we accept, not only the general practitioner, but the scientific thinkers along this line. I think this is the consensus of opinion in all endemic regions where this condition is so prevalent, and yet why is it when this enamel is so defective and the integrity of the enamel is held to be a determining factor in caries, that Mottled enamel, which is obviously defective does not disintegrate any faster than normal, if as fast?

The other viewpoint that the environmental factors or a combination of factors is the real causative factor in caries has as its champions, these who rely upon oral hygiene as preventive measures adequate to cope with the inroads of caries and yet the wisest of this school of thought feel that the complete conquest could only be realized by the discovery of methods that could be applied more deeply than in the environ-mental control.

The studies now current are directed toward the alteration or improvement in the structure of the enamel through metabolic processes, based upon a superior rationale of feeding. By this it is hoped that beneficial elements perhaps calcific, may be presented to the enamel even when "fully formed" and incorporated into the structure of the enamel, thereby increasing its so called "vital resistance" to decay.

Metabolic activity in any kind of tissue demands, as a prime requisite, the functional presence of living cells. All our concepts of a metabolic process demands the appropriation and incorporation into the tissue of nutritional material by appropriate biological machinery. That such a state of affairs, is denied by the current opinion of enamel histologists. These men claim that a metabolic process in the enamel is a biological impossibility, for the simple reason that living cells are not found in enamel, but on the contrary that enamel is a "calcified fossil", in that the original formative cells have become calcified and are "frozen" into the completed structure and their function forever ended. This subject has had wide discussion. You all can recall the debate in New York, Pennsylvania hotel

when three of the leading exponents of each side debated the question, "Will a clean tooth decay?"

In discussing the possibility of metabolic processes within the enamel, much emphasis is placed on the penetration of the enamel by some of the dentinal tubules. Dr. George A. Bates in discussing Dr. William's paper said, "Does the dentinal tubule penetrate the enamel? If so, how can it carry on the process of lymphatic circulation in the absence of cells in the enamel? And we know this is the only possible way for metabolism to occur. The claim is made that there is a circulation in the dentinal tubule. If this is true, whence comes the circulation- medium and where does it go? If it emanates from the pulp and passes through the tubule, returning again to the pulp, what purpose does it serve? It must be lymph, if it serves any good purpose in the interest of metabolism, it is difficult to determine where the metabolism occurs since, with the exception of the odontoblasts there are no cell elements in the dentine or enamel. All metabolism must occur in the odontoblasts, since this is the only cell involved," and he closes his discussion by saying "All the evidence thus far advanced to demonstrate this fact, is very inadequate and unconvincing"

Although G. V. Black says, "That enamel is not permeable", it has been conclusively proven by Williams and others that even the best or most perfect enamel is easily permeable and to any depth. And Williams further maintains that no enamel is impermeable, but this does not imply "vitality".

It might seem that all this leads us far afield from the topic of Mottled teeth and what they may indicate in the feeding of the infant, but not so. The chances are that right here in this so-called mottled enamel we have the confirmation of our theory of immunization and preventive dentistry as far as the teeth are concerned.

So far as human enamel is concerned, it is not as yet known what nutritional elements may be included in the diet that will beneficially influence its structure either during or after its formation. There is no one element as yet identified that will act positively and unvaringly in all cases within the same environment or circumstances to produce better quality of enamel.

The study of Mottled enamel, however, has revealed a fact with just the opposite bearing, for we know that certain waters contain certain ingredients that invariably produce the same lesion in the outer layer of all enamel that is built or developed during the time the individual maintains a constant use of that water. We know that the enamel **fails** to complete its full typical development under adverse influence, or the enamel **does** complete its definite formation and is later partly destroyed by this same adverse influence.

At all events, we are dealing with a dietary or nutritional error, and we also know of no other such error which acts so definitely, positively, and without fail, and which goes always so straight to the point as does this one. We are thoroughly convinced that as viewed under the microscope, the appearance of Mottled enamel is identical with that of incipient caries.

CONCLUSIONS

Mottled enamel in mild form is endemic in Ohio, particularly in Counties in the northwest section of the State. In a number of other states the situation is far more serious. It is definitely shown that this dental defect is due to the presence of Fluorine in the water used for cooking and drinking purposes and that mottled enamel may be expected to develop if the water contains more than about 1.0 p.p.m. fluoride.

Recent studies indicate that over treatment with lime to a causticity of about 2 grains per gallon, in the presence of sufficient magnesium, between the limits of 1.5 and 3.5 p.p.m. fluoride can be reduced to 1.0 p.p.m. residual fluoride. The removal of fluoride in this process varies as the square root of the removal of magnesium.

With practically no modification, water softening plants of the standard type are adaptable to fluoride reduction problems. Ordinarily, only the small municipalities are concerned with the fluoride removal problem.

This is accounted for by the fact that the water supply is from deep wells, often artesian wells, and the water is heavily charged with the toxic fluoride.

The water supply of larger centers is generally surface water obtained from lakes or rivers on which they are often located, and surface water has less fluoride, generally.

It would be well then for those living in small towns to see to it that their water supply does not contain 1.0 p.p.m. or over, if so, have it changed or expect the teeth of not only the infant, but those of later life, to become mottled.

Send a sample of the water to the State Chemist, at Ohio Department of Health for analysis.

Fluoride problems require for solution the cooperative efforts of the dentists, the chemist and your water-works engineer.

A MEMORIAL TO DR. ALFRED C. FONES

The annual meeting of the Bridgeport Dental Hygienists' Association was held on May 17th. At this meeting the members voted to perpetuate the fond memory of its beloved founder, Dr. Alfred Civilion Fones, by establishing a fund for an annual prize essay contest to be offered to the English Department of the Connecticut Junior College. Dr. Fones, whose life was one of untiring service to the youth of Bridgeport was one of the founders of this institution. He spent the greater part of his time, energy and fortune providing for the welfare of the children and younger people of his community. It was also voted that each year in the month of June the Associaton should further honor his memory by placing flowers on his grave. His untimely death is a great loss to the city of his birth as well as to the dental hygiene profession to which he was so devoted.

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Editorial

TEAMWORK

DO you enjoy sports? Did you ever attend a football game, and permit your mind to wander for minutes from the colorful, cheering crowd; the mass of humanity tumbled together in some part of the field after the signal was given, and tried to visualize what was going on in their minds? If you have, you will know they were following the dictates of their captain; working as one individual to put the ball into the hands of the person best suited to carry it over the goal. They were battling together as one for the success of the team and the approval of their audience.

As teamwork is indicated in any sport—it is also, in an organization; even our own. Stop for a minute and consider what is taking place behind the scenes there. At our last annual meeting you elected your President; one who was chosen for her ability, her untiring efforts through long years of service to the Association. Immediately following her election, she called together her Board of Directors and officers and the question for consideration, was the meeting to be held in St. Louis a year from the next October. Chairman of committees must be selected; chairman who would if necessary, sacrifice their own time and energy to fulfill the duties for which they were responsible. Every committee chairman was an experienced person, one who had served their time under another leader in years before; one who was capable of accepting the responsibility for a task and doing it well.

What teamwork is required in the preparation for such a meeting as is to be. Fairplay such as we always expect to find in a football game must be practiced. No one may work for their own glory but all for the success of the meeting. The audience must be considered—everything must be for their comfort and enjoyment. It must be appreciated that some will travel far and at a great expense financially and of their time. The program must be such as will be stimulating, must be of such a nature as anyone, regardless of her particular field will derive intellectual benefit. Care must be exercised to keep the costs not only within the budget of the Association but within that of those who will attend.

Consider again the football game and the reaction of the spectators. If the seats are filled and the crowd enthusiastic, the team will play the best game to give satisfaction. Their own enthusiasm is increased as they note for an instant before the game starts the interested throng. Or there may come a minute during the game when a deadly silence prevails; the most strategic play when anyone may win. The audience is just as important as the performers.

But what of our own meetings—our own audiences during any session? Do they provide a stimulus for the speaker—do they encourage those who have worked for the success of the program? Are the seats filled or does the speaker gaze upon an audience so small that the whole thing is an insult to his or her ability?

I personally believe, after years of attendance at National Meetings that no word of criticism may be voiced of our committees; moreover, I can say this as one who has never served on a committee. But many, many times, I have felt indignation creeping into my entire being—I have wanted often to apologize to the speaker for the lack of spectators and the indiffernce of members to their responsibility.

Consider again, and this time try to visualize our organization —our profession, if you please, and what our standing would be if

we held no meetings. We are sparsely scattered throughout the United States. No one individual has as yet gained sufficient recognition to make our profession known. People the world over know what dentists, doctors or nurses represent but among the best educated people there are those who know nothing about the dental hygienist. Therefore, to become known as a profession is alone, reason enough for our meetings regardless of all else and yet, our meetings cannot continue without teamwork on the part of all members.

Full well I realize the inability of many persons to attend a meeting but more could if they only would. Let's get together for St. Louis, October 24. Let us show our appreciation to our President, the committees, the essayists and clinicians who have provided for our program. Let us prove our interest in the profession we represent by getting back of it and working for it. There will be no sacrifice on the part of anyone, for all who attend will be well repaid for their effort. The stimulation alone, gained from the knowledge of having attended our annual meeting is fitting compensation for all the effort that has been made.

COOPERATION BETWEEN THE DENTAL HYGIENIST IN THE PRIVATE OFFICE AND THE DENTAL HYGIENIST IN PUBLIC HEALTH WORK IS ESSENTIAL TO THE SUCCESS OF ANY COMMUNITY PROGRAM

NO one group of persons who are interested in the welfare of human beings can work satisfactorily unto themselves and be totally oblivious to what others about them are doing. No one dentist or dental hygienist can work effectively alone without at some time being forced to admit that there are others whose work is closely allied to theirs.

There is the case of the dental hygienist in a private office in the same community where a dental hygienist is employed in the public schools. It has been apparent on one occasion at least, that a child who may have gone to his family dentist and there received care from the person employed by him, has had his teeth cleaned by the dental hygienist in the school. As a natural sequence to events, there was criticism of the dental hygienist employed by the school board and she was accused of presuming on another person's rights.

What should be the attitude of the dental hygienist in the private office—make an issue of the case, as she did, or frankly discuss the situation? After all, the incident was trivial in itself but made, due to inconsideration, plus lack of understanding, an issue causing grave concern to several people.

Hundreds of children, never having visited a dentist in their lifetime are doing so now as a result of the educational work that is being done in the schools. These children are the dentist's future practice and, education continued upon their arrival in his office will only tend to support favorably, instructions and information gained before.

However, this cannot be done unless the dentist and tne school program; will visit the school occasionally and learn the dental hygienist in private office will concern themselves with the method of procedure followed there. On the other hand, the dental hygienist in the public schools cannot prepare a child for his first visit to the dentist unless she knows something about the office to which he is going.

For the ultimate good of all concerned, all should be conscious of and familiar with the other's problems. They should have a general understanding of the efforts each one is making and why they are making it. Criticism, inter-professionally, is definitely a stumbling block to growth and advancement and the most hazardous road to successful achievement of any purpose.

After all, our first consideration is the patient. We cannot undermine his faith in one or the other. Our aim is dental care for the individual and the acme of our success; his interest in maintaining mouth hygiene. All matters eventually rest in the hands of a dentist who will minister unto his needs and who, after the first visit or two, may turn the patient over to the dental hygienist in his office.

Children who receive dental hygiene instruction in school are extremely fortunate but also are the dentists who have practices in such communities where a dental hygienist is employed in the schools. She is the one who will first prepare the way and she it is who gets the majority of the children to the dental office in the first place. Consider years past when a child seldom went to a dentist for other than relief from an aching tooth—consider the situation today. Do you not agree that there is a great need for cooperation on the part of all who has or will, ultimately have some interest in the welfare of children?

WITH the passing of Dr. Charles Nelson Johnson, Editor of the Journal of the American Dental Association, our own Association and profession has lost a true and valued friend.

When our JOURNAL came into being, Dr. Johnson lent to our first editor, kindly advice and constructive criticism: he has done the same by the present one. Always interested, even in his busiest moments, he has, unknown to our readers solved many of the most perplexing problems that confronted the Journal Staff.

Dr. Johnson was the best loved man by the dental profession, it is true, but he was loved as well by all who knew him. Many of our own members knew him personally and his sincere belief in the service that we have to offer;his belief in the ideals of our profession has in the past, and I know will in the future, encourage us to be true to that belief.

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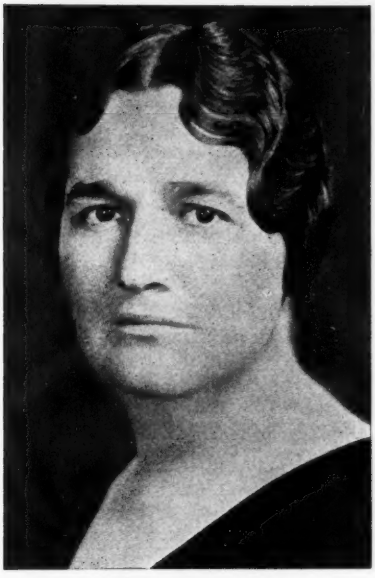

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Helen Lidberg, 180 N. Michigan, Chicago, Ill.

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SURVEY OF CLASSIFICATIONS from STATE BOARDS
Ch. Gladys Flint, 106 Marlboro St., Boston, Mass.
Margaret Stickel, 1421 Webb Ave., Detroit, Mich.
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SURVEY OF TRAINING SCHOOLS (report as of Dec. 31st, 1937)
Ch. Margaret Bailey, Temple U. Dental School, Phila., Pa.
Ruth Heck, Temple U. Dental School, Phila., Pa.
Blanche Downie, Penn. U. Dental School, Phila., Pa.

WORLD'S FAIR EXHIBIT
Ch. Henrietta Waters, Box 321, Huntington, L. I.
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CELIA PERRY
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MABEL McCARTHY
Educational

COMMITTEE

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World's Fair Exhibit

SOPHIE GUREVICH
Legislative and Ethics

GLADYS FLINT
Survey of Classifications

Diet and its Effect Upon Blood Formation

DR. FRIEDA S. ROBBINS, *Pathological Dept.*
School of Medicine, Rochester University

INVESTIGATIONS carried on for many years in our laboratory have definitely demonstrated that the amount of blood formation in the animal body can be modified at will by diet factors. This control can be readily demonstrated week by week.

A severe secondary anemia in a dog, produced by withdrawal of blood, offers an excellent means of testing the efficacy of stimuli for blood production. Such a long sustained severe anemia insures a maximal stimulus to red cell and hemoglobin formation. The dog is an experimental animal par excellence for this type of investigation. It is an omnivorous animal and on suitable diets may be maintained in health for many years in spite of an extreme anemia. Our experimental colony contains dogs which have been severely anemic for a period of from six to eight years.

METHODS

These studies concern an experimental anemia produced in dogs by the frequent withdrawal of blood. The animals employed are born and raised in our own kennels and are of well-known stock whose various reactions are familiar to us. The breeds used for this investigation are represented by a white bull terrier mongrel and a Dalmatian coach hound. They are vigorous and hardy animals of gentle disposition and, in addition, have excellent appetites. Our animals are kept under optimum environmental conditions; the cages are sufficiently large to permit exercise. Enclosed court yards to permit out door exercise adjoin each dog room. Extreme care is taken to keep these animals healthy; they are carefully isolated so as to prevent intercurrent infections. As soon as puppies have attained sufficient growth for effective immunization they are vaccinated against distemper.

When the dogs have reached adult age they are included in the anemia colony. Their blood picture is then studied, this investigation including determination of the circulating volume of blood, counts of the blood corpuscles and careful estimation of the amount of hemoglobin or coloring matter contained within the red blood cells. Normal red cell counts of our kennel-raised animals range within 6 to 8 million corpuscles per cubic millimeter of blood, with hemoglobin values of 120 to 150 per cent or the equivalent of from 17 to 21 grams per 100 cc. of blood. The dogs are then rendered anemic by frequent bleedings spaced at one or two day intervals. Once the desired level of approximately one-third normal or a hemoglobin of 40 to 50 per cent has been attained, further bleedings are graded as to frequency and amounts in order to maintain this level as near a constant as possible.

The hemoglobin contained in the red blood corpuscles serves as an excellent medium of measurement for blood production. This blood pigment is determined quantitatively in grams in all blood withdrawn. The figure

obtained indicates the capacity of that animal to build hemoglobin on a given diet intake, since the anemia level is maintained as a constant as far as possible. Dogs normally have unusually large reserves of potential blood-building stones which enable them to regenerate large amounts of hemoglobin and red cells during the early anemic state. It is therefore essential that these large reserves be exhausted before attempting to evaluate the effect of any stimulus to red cell and hemoglobin production. Dogs are fed once each day. Actual food consumption is determined daily and any portion of the diet left in the food pans is carefully reweighed. The animals also are weighed daily so as to insure ample caloric requirements for proper weight maintenance.

The food ration consists of a basal bread mixture plus the unknown diet factor which is to be tested. Sufficient water is added to give a hash of suitable texture for thorough mixing. The various food ingredients are therefore so thoroughly mixed that the dogs cannot pick out any particular morsel which may be more to their taste. A test period for the unknown diet factor consists of a two-week feeding period. This is preceded and followed by a control period of two weeks' feeding of the bread ration alone.

The basic food ration is of the greatest importance for long continued anemia experiments. This food must be palatable and yet permit of minimal hemoglobin and red cell production, since it must serve as a control for the unknown or test-diet factor. The basal ration meeting necessary requirements consists of a bread mixture. Its ingredients consist of wheat flour, potato starch, sugar, canned salmon, tomato juice, cod liver oil, yeast and a suitable mineral mixture. This bread represents a complete diet upon which dogs may be maintained in an excellent nutritional state for months or even years. It permits, however, only a slight hemoglobin production, approximately 1 to 3 grams per week above that unknown amount utilized for general wear and tear.

DIET FACTORS

A maximum response of blood formation follows liver feeding and a minimum after cereals and bread stuffs. Between these two extremes we observe all types of reactions.

Dairy products. The addition of large quantities of milk to the bread ration has no significant influence upon blood formation. Whole milk, even when fortified with 100 cc. of cream, will cause only a slight increase in hemoglobin production above the control levels. Supplementing the basal ration with butter results in a hemoglobin production of 10 to 20 grams following a two-week testing period. Adding "American cheese" to the bread diet results in figures for hemoglobin output similar to those obtained by butter feeding. One might suggest that the favorable reaction to cheese may be largely due to the butter fat content.

Whole milk is decidedly inadequate as a diet factor for the production of red cells and hemoglobin. Dairy products are known to contain many invaluable food factors which furnish general nutritional requirements, but their content of substances which aid the body to build red blood cells and hemoglobin are conspicuously meagre.

Vegetables are credited with much greater potency than they really deserve. Green vegetables are constantly lauded as stimulating blood formation. Their content of iron is particularly emphasized. Our experiments with a liberal intake of various greens furnish no confirmatory evidence of unusual potency. The leafy vegetables such as spinach, chard, beet greens and lettuce may be considered only as moderately favorable foods for blood-building. Spinach and beet greens seem somewhat more potent than lettuce, although the differences are not striking. Asparagus, carrots, beets, celery and Brussel sprouts are relatively inert. One may state that, on the whole, the presence of large amounts of these various vegetables in the diet modifies but slightly hemoglobin and red cell construction.

Fruits. Experiments with fruits have furnished us with data of extraordinary interest. Some fruits demonstrate considerable potency, while others are quite inert. For example, a considerable quantity of raspberries added to the bread mixture gives completely negative results, whereas the feeding of apricots or peaches stimulates hemoglobin production to the extent of 40 to 45 grams following a daily intake of 200 grams of these fruits for a two-week period. These figures compare favorably with the results obtained with some meat products. Peaches and apricots have been tested in the form of fresh, canned or dried fruit and all have been found to be of equal potency.

Prunes are only slightly less favorable for hemoglobin production, giving values of 35 grams following a two-week feeding period.

Apples in the fresh or dried state show considerable variation in their effect, but rank about equal with raisins and grapes. These fruits give values of 20 to 30 grams of hemoglobin above the control levels.

Numerous experiments with the feeding of ash, obtained from apricots and peaches, have demonstrated that this inorganic material retains most of the potency of the whole fruit.

Minerals. It is very evident from these experiments that minerals play a very definite role in the production of red cells and hemoglobin in this type of anemia. Among the minerals which demonstrate only the very slightest or no influence on blood production when tested singly, are manganese, zinc, aluminum, antimony, sodium iodide, potassium and calcium phosphates. All of these salts are found normally in the body and some of them are known to take part in certain metabolic reactions.

The most mportant mineral concerned in blood formation is iron, since it is contained in the hemoglobin structure. There is no reasonable opposing argument with regard to the positive effect of iron in severe, long continued secondary anemia due to hemorrhage in dogs; there does exist, however, many differences of opinon as to its value in other types of anemia. Iron, for example, may be effective in hastening recovery from loss of blood, and yet be totally inert in an anemia resulting from dietary deficiencies. Exhaustion of iron reserves, and therefore a real need for this material, is probably the most important factor concerned in the utilization of iron for hemoglobin formation. Our experiments indicate that the addition of 0.2 grams of an iron salt daily to the bread diet permits a

hemoglobin production of 40 to 50 grams following a two-week feeding period.

Copper has come into the limelight within the past few years. Our experiments have demonstrated that copper belongs to the group of salts which can cause gastrointestinal disturbances in our animals and may therefore be toxic. Copper added to the basal bread has not called forth any extensive production of new red cells and hemoglobin in our hemorrhage anemia.

Liver. The most potent substance for the sustained production of hemoglobin and red cells is represented by liver. This extremely favorable reaction is invariable in our dog experiments no matter how long the anemia has existed, or how unfavorable the preceding diet periods may have been. The same response is obtained whether the animal has been anemic for 6 years or for 1 year. For example, if one has removed one-half of the total circulating blood volume of a dog, in several bleedings, and then gives this animal a diet containing 200 grams of cooked liver daily, this entire blood loss plus an excess will be regenerated within a two-week period. Such a dietary permits a hemoglobin production amounting to 100 grams following a two-weeks' feeding of liver. Livers from calves, cows, pigs, sheep and lambs have been tested and have been found to be of very similar potency. Special preparation of the liver material seems to have little influence, there being little or no difference in hemoglobin production whether the liver is fed raw or cooked in any simple fashion.

An extract prepared from liver by the Eli Lilly Company of Indianapolis for the treatment of secondary anemia has a potency of approximately 65 to 76 per cent of that of whole liver.

It is of interest to note that chicken livers have been found to be equally as effective as mammalian liver. Fish livers, however, obtained from a large variety of fresh as well as salt water fish are totally inert as blood builders. Only slightly less favorable than liver are chicken gizzards. Calf, beef and pig kidneys are also substances nearly as favorable for hemoglobin and red cell formation as liver, a response of 80 to 90 grams of hemoglobin being obtained.

Many experiments have been carried on with the feeding of beef, veal or pig muscle. Results show considerable variations, appearing more favorable in some cases than in others. The actual figures observed correspond somewhat to those obtained with the feeding of apricots or peaches, a production of 45 to 55 grams of hemoglobin above the control levels following a two-week feeding period.

Clinical application of these experimental results led to the dietary treatment of Pernicious Anemia. Liver, the most potent factor, was tried with results now known to everyone.

Various abnormal conditions may influence blood formation under any dietary regimen. We refer to infections, and the attendant state of intoxication. When clinical anemias develop in association with infection, the tendency is to explain this abnormal state of the blood on the basis of blood destruction, or lack of absorption from the intestine. Our experimental studies indicate that the cause is rather a disturbance of internal

metabolism, which is concerned with the building of the hemoglobin structure. Evidence of any significant blood destruction is lacking; but ample data is available demonstrating that the absorption of food products is entirely normal under the conditions of these experiments. When food consumption is 100 per cent, digestion normal, and body weight maintained, we believe that lack of absorption is not indicated.

A sterile abscess produced experimentally results in considerable pus formation with an intoxication of moderate degree, and gives clinical signs similar to a bacterial infection (fever increased number of leukocytes). A marked falling off in hemoglobin production was noted. Similarly, older dogs frequently develop pyorrhea. In cases of extensive subacute pyorrhea blood formation was considerably decreased. The removal of abnormal teeth and proper treatment of gums to insure prompt healing was followed by a normal production of red cells and hemoglobin.

A laboratory infection (endometritis) in several anemic dogs gave further evidence of definite falling off of blood formation under such conditions. In one animal whose food consumption was entirely normal, blood formation began to fail slowly. Finally the dog could form no hemoglobin even on a generous liver diet, and blood transfusion had to be given. A vaginal discharge pointed to the uterus as a focus of infection. Operation showed a greatly enlarged uterus and removal was promptly followed by a return to normal hemoglobin production. Such infected or intoxicated animals even on very potent diets for hemoglobin production are unable to manufacture any surplus hemoglobin, and frequently cannot even meet their hemoglobin requirements as cited above.

Summarizing, these various observations cited, we again emphasize that under experimental conditions described, blood formation may be controlled at will by a dietary regimen. Such abnormal states as infection or intoxication may markedly influence blood formation.

NOTICE FOR THE JOURNAL.

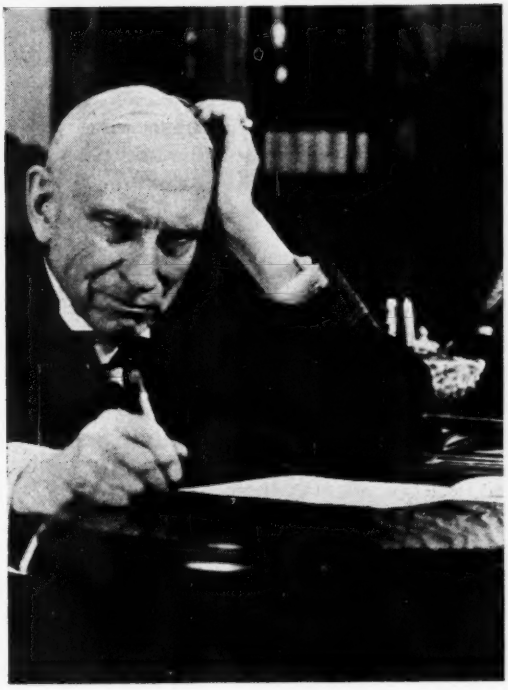
The entertainment committee would like to recruit some entertainment from among our members, who have any specialty such as singing or dancing, that they would like to share with us at the informal supper program on Monday evening of convention week. This supper is being planned so that the girls from all sections of the country may become better acquainted, and through an exchange of ideals and objectives carry home new ideas and encouragement.

All members are to be guests of our National Association at this supper and we hope to make it one of the happiest events of our convention.

Your co-operation would be greatly appreciated.

ANNE E. WILTSHIRE
50 Essex Street
West Medford, Massachusetts
Chairman Entertainment Committee.

DR. C. N. JOHNSON



DR. C. N. JOHNSON

"It is with extreme regret that the Illinois State Oral Hygienists' Association announces the death of Dr. C. N. Johnson, known as the dean of dentistry. He passed away at his home in Chicago on July 17th after suffering for a few days from a heart attack. Dr. Johnson, who was 78 years old had practiced dentistry in Chicago since 1885 and, despite his age, still did so up to the time he was stricken. Two weeks before his death, he was the guest of honor at the Pacific Coast Dental Congress in Vancouver, B.C., and was an honorary member of dental societies from Japan to Uruguay. Since 1925 he had served as editor of the Journal of the American Dental Association.

Dr. Johnson was educated at the Royal College of Dental Surgeons in Toronto and at the Chicago College of Dental Surgery. He was dean of men and professor of operative surgery at the latter institution since 1891.

Dr. Johnson was the speaker of the initial annual meeting of the Illinois State Oral Hygienists' Association which was held in February

1930, in conjunction with the Chicago Dental Society. He was instrumental in organizing our Association. He has been one of our most loyal and staunchest supporters, as well as an honorary member of our Association since the first meeting.

Kept busy with his practice and at various times with his work as president of both the Illinois State Dental Association and the Chicago Dental Society, he still found time to devote to writing poetry, and was the author of "Poems of the Farm", as well as professional writings like "Filling Teeth" and "Operative Dentistry". Surviving are two daughters, Mrs. Dewson and Mrs. O. T. Carpentier, both of Chicago.

The officers and members of the Illinois State Oral Hygienists' Association extend most heartfelt sympathy to the bereaved relatives."

CONVENTION CLINICS

"PROGRESS IN DENTAL HYGIENE"
Florida Dental Hygienists' Association
Clinicians: Misses Celia Perry, Chr.
Pearl Buffum
Catherine Mooney
Ijourie Stocks

"THE DENTAL HYGIENIST AS THE DENTIST'S PRACTICE BUILDER"
Wisconsin Dental Hygienists' Association
Clinician: Miss. Mary Mikalonis

"STERILE TECHNIQUE"
Massachusetts Dental Hygienists' Association
Clinicians: Misses Edna Haliburton
Ann Wiltshire
Lillian Landry

"WEEPING WILLIE and SMILING SAM"
District of Columbia Dental Hygienists' Association
Clinician: Miss Sophie Gurevich

"PRACTICAL DEMONSTRATION OF ORAL PROPHYLAXIS"
Connecticut Dental Hygienists' Association
Clinician: Miss Mabel McCarthy

AGNES H. PHILLIPS,
Chairman, Clinic Committee.

Some Problems of the Child Patient in General Practice

BY EUGENE VEASEY, D.D.S.
Wilmington, Del.

IT has been my experience that the most successful way to practice preventive dentistry is with the child. While success in prophylaxis to a certain degree can be accomplished with adult patients, the child patient presents a more fertile field. The younger the child when the dentist first sees him, the more successful will be his efforts in prevention, providing he gets the whole hearted cooperation of the parents. I think perhaps the dentist in most cases fails to put enough emphasis on the cooperation of the parent to the parent and accepts too much of the responsibility himself.

The child if possible should first be seen by the dentist between the age of two or three. The first visit should be devoted primarily to letting the little patient make your acquaintance and in some cases, a prophylactic treatment is begun at this visit. I feel that the first visit is very important and the dentist and his staff should be very careful to make this first visit as well as later ones pleasant. A gift or some token given at this time will aid in making the visit more attractive.

The plan of organizing clubs similar to the "I Can Take It Clubs", or "The Oral Happiness Club", I think has merit. Some may think perhaps that plans of this type may seem to be "Over-doing it", but I think anything that will encourage these little fellows to protect their present and future oral and general health is well worth while, even though it might require considerable effort on the part of the dentist and his staff.

When the patient presents himself, our first procedure is a prophylactic treatment or at least a partial prophylaxis. Emergency service is also administered at this first visit if there is an aching tooth or anything of that nature. Home care of the mouth and teeth are also stressed to the parent as well as the child at this time. The technique of home care should be explained thoroughly. An illustrated chart showing the proper toothbrush technique and other important instruction should be given to the parent or child or both. Plaster models or a typodent should be used to demonstrate the proper tooth brush technique. A new toothbrush should be given the patient with which he is allowed to practice this technique in the operator's presence. This tooth brush should be kept in the office in a sanitary condition until the child returns and a check again made to see if he has mastered the technique.

A blank form is given the parent in order that she may list the diet of the child for each meal, each day for a period of at least one week. Also, anything that is taken between meals (such as candy, etc.) should be entered on this form. When this form is returned at the end of a week

properly filled out, it can be evaluated and studied, and corrections made or advised. The parent should be made to realize that the diet for this week should not be changed for this test, but should be an average diet such as was taken prior to this time.

After the prophylaxis is completed and at a subsequent visit (or in some cases the first visit) Howe's Silver Nitrate solution is applied to the interproximal surfaces of all teeth. The object of this application is to keep down the incidence of interproximal cavities. I have been following this procedure for the past two or three years and I think this technique holds promise of exceptional merit. Dr. Prime of Omaha, Nebraska deserves credit for this technique and I refer you to articles written by him in the last two or three years which have been published in the Journal of the American Dental Association and Cosmos.

I think the child patient should return for prophylaxis and a thorough check up every three months for at least the first two or three times and then it may be determined by the conditions found whether the time should be lengthened, shortened or kept the same.

Bite-Wing X-Rays should be taken frequently on all children. While this procedure is desirable in adults, I think it is even more important in the child patient. Two lateral jaw roentgenograms and two anterior occlusal roentgenograms should be taken during the first series of visits and from time to time as deemed advisable. I think this is very important so that abnormalities may be discovered as early as possible and proper preventive measures taken and necessary treatments begun.

The services of a dental hygienist are certainly a decided advantage in managing children, particularly in the above preventive procedures. She can devote more time to this work than the dentist in most cases will feel justified in doing. If this preventive program is started early and thoroughly followed most of the service required from there on will be prophylactic in nature and the dental hygienist, of course, is qualified to carry through most of these procedures.

From the health point of view as well as the economic point of view it is to the advantage of the parent and child to follow a procedure such as this, and the dentist and dental hygienist should certainly be enthusiastic in educating the parents so that they may take advantage of such opportunities.

It has been estimated that of the permanent teeth, six percent are lost eighteen months after eruption, and that before a child reaches the age of twenty, over thirty-five percent of the permanent teeth have been lost. Further, it has been estimated that by the time a person reaches the age thirty-five, over fifty percent of the permanent teeth have been removed. I think that most anyone, who knows anything about dentistry will appreciate the fact that most of this toll of dental disease could have been prevented, and prevented at a far less economic loss than the destruction has

caused. Just imagine, if you will, the great loss from the health side of the picture, that could have been prevented in these cases. If eight out of every ten diseases that mankind may in some way fall heir to, are associated with the oral cavity as we have been taught to believe is the case, just imagine the condition of the general health of these patients prior to the age of thirty-five, with caries and other oral infections rampant. Just imagine what it would have meant had most of this been prevented. Think of the number of lives that would have been saved either directly or indirectly and the improved general health of the people as a whole. As a comparison, considered economically, most of this could have been prevented at a cost probably not more than that which is expended by a number of people for cigarettes.

The management of the child in most cases is not as difficult as it at first might seem, if the dentist has some definite plan of procedure. The plan, I think, in all cases must be carried out first of all with kindness and secondly, with firmness. He must be kind to the child yet there are times when he must use a certain amount of firmness. Success in handling children will be his reward if these two factors are worked together. Most children react well to kindness but from time to time, some children will take advantage of his kindness. In these cases, firmness should be resorted to without delay.

The children that are most difficult to handle are those that are stubborn and spoiled and those that are frightened. The child that is afraid is usually much easier to handle than the stubborn and spoiled one. In most cases he can be conquered by kindliness, and by having explained to him just what you plan to do in a slow and leisurely manner. The parent of the spoiled child must be asked to remain in the reception room and told that the dentist will have to use a "little force" but that he will not be hurt. We carry the child to the operating room and place him in the chair. A folded towel is then placed over his mouth and held firmly. In doing this, of course, no demonstration of temper should be displayed by the dentist but rather, an attitude of kindness. The assistant may be useful in holding the child's knees to keep him from kicking. The child is not hurt by this treatment, but is made very comfortable. He will soon quiet down and then the towel is removed. He is then told gently, but firmly, just what we propose to do. If he tends to become unmanageable again, the towel is again applied and the child assured that this will continue until he is manageable. This type of child incidentally, very often makes the best patient. Caution should be used to make this first visit painless. The plan should be, on this first visit merely to gain the confidence of the child.

A great aid in handling children I think is to allow them to ask questions, and it is time well spent to answer them intelligently and in a way that they will understand.

Psychology is important in the practice of dentistry for the child and sound psychological theories should be followed at all times. To be successful in handling children the dentist must be continually analyzing his own short-comings and his own psychological appeal to children.

Endocrinology

BY JULIANA C. SWINEY, M.D.
New York

Read at the January Meeting of the New York State Dental Association

WHEN people ask me, as they ask every young doctor to his embarrassment, "In what are you specializing?" and I reply, "Endocrinology", they usually say, "What on earth is that"? NOW I am going to answer that question. I hope it will prove as fascinating to you as it is to me. The lay person has already begun to refer to phases of endocrinology. Perhaps you have heard some one whisper, about some person of extraordinary proportions, "It's his glands." She would probably have been embarrassed if questioned further as to which glands she referred. They are really the endocrine glands, and the study of these is called Endocrinology.

This is the youngest field in medicine. It has taken only its first step between the research laboratory and the field of practical medicine. Much of it is still a mystery, but we are making rapid strides in penetrating the haze.

A gland is a group of cells that elaborate a secretion for the use of some other organ. We must distinguish between two kinds of glands; those from which the secretions are led away through a duct to their place of action, e.g. salivary glands, and those which are ductless. The latter glands are those which secrete their products directly into the blood stream, and are called the ductless or endocrine glands. The secretions of these glands are known as hormones. Many of these have been isolated in the bio-chemical laboratory. Most of the products extracted from the active glands cost prohibitively, since so many animals must be sacrificed and the process of purification and assaying is so complicated. Thus the use of glandular medicine in treatment is greatly handicapped. Few clinics have sufficient endowment to provide such medicines for their patients and the latter cannot afford to purchase them, even at cost. The few private patients who can afford them do not offer sufficient numbers from which to draw conclusions. Our hope in the advancement of Endocrinology, therefore, lies in the discovery of inexpensive but potent, synthetic hormones. Already, many of these have appeared on the market but every day brings forth new substances—most of those to be discarded shortly for improved products, but each is one step nearer our goal.

Even the number of ductless glands vary in different textbooks. The existence of endocrine tissue in some organs of other known functions is disputed. The usual list of endocrine glands, however, comprises: the Pituitary, Thyroid, Parathyroid, the Islands of Langerhorns, the Adrenal, the Testicle and Ovary, the Placents, the Pineal and the Thymus.

Since the actual exstence of some of these glands is disputed, you may guess how little we know of their functions. Our clinical knowledge is derived largely from the cases in which there is a deficiency or an overabundance of hormone secreted from these glands. A difficulty in diagnosis lies in the fact that there exists a close relationship between these

glands, a depression of one causing either a depression or acceleration of the activity of the others, often giving a confusing picture. The solution is often more difficult than any jig saw puzzle, and is ever so much more fascinating. In no one organ in the body is the endocrine status of the individual more completely betrayed than in the mouth. "Since the eruption and later maintenance of the teeth and the integrity of the surrounding tissues is largely under the control of the endocrine glands, it seems of importance to be ever mindful of this particular change in the mouth which a certain endocrinopathy is apt to produce". The development of the bones entering into the formation of the face and oral cavity is under the control of the ductless glands. If discrepancy exists in rapidity and force of the growth impulses proper spacing, size, shape and occlusion of the teeth and normal shape of the palate are impossible, so that glandular disorders constitute one of the important causes of malposition of teeth, with consequent dental impairment, speech disturbances, etc. Hence endocrine therapy can be of great assistance to the orthodontist.

The regulator of the entire endocrine system is a mysterious mass of tissue, not even the size of a thimble, lying at the base of the brain, directly behind the nose, the pituitary gland. This is the most complicated gland of all. Six functions have already been described and there may be as many more added to it on further investigation. There are two separate parts to this gland. Each part is distinct from the other anatomically and functionally. They are called the Anterior and Posterior. The anterior pituitary gland produces a growth stimulating hormone, too little of which produces dwarfism and too much of which produces giantism. If certain types of dwarfs are treated before their bones have lost their power to grow, a dramatic stimulation of growth may result from injections of an adequate amount of the growth stimulating hormone of the anterior pituitary gland. In dwarfs, in keeping with the other infantile characteristics is the size of the teeth and jaws. They have small teeth, especially extremely stunted cuspids, small maxillae giving a narrow, constricted high arch, and a more or less receding chin. The teeth are, therefore, crowded in a small jaw usually giving malocclusion. There is frequently a delayed dentition and a tendency to rapid decay. They may have large and well spaced central incisors. With an increased activity of the pituitary glands there occurs a premature appearance of teeth, a separation of the teeth especially between the incisors and cuspids. The teeth are large in accordance with the stimulated growth. The mandible is large, giving no crowding. The teeth are unusually resistant to caries.

A second function of the anterior pituitary gland is that of gonad stimulation, i.e. regulation of the ovarian and testicular activity. We hope that there lies the solution to many gynecological problems of menstrual disturbances, sterility, etc. Although many cases have shown remarkable improvement on endocrine therapy, the results of treatment are still uncertain.

The flow of breast milk is induced by a hormone, Prolactin, which has been isolated from the anterior pituitary gland. This has been proved to be wonderfully effective in maintaining an active milk supply. Its prohibitive price makes it impractical for general use. Borden's weekly bill for certified super-vitamin milk is far less than two injections of prolactin. In

a recent newspaper article, the Professor of Anatomy at Cornell Medical School told of an experiment in which a virgin rat was put in a cage with a litter of baby rats. The former was entirely uninterested in the latter. After a few injection of Prolactin, she became very maternal.

A separate hormone for the stimulation of each endocrine gland is produced in the anterior pituitary and also one for the regulation of the consumption of each of the types of foods—carbohydrate, protein and fat. Thus disturbances in pituitary activity usually effect one's weight.

The posterior part of the pituitary, we believe, has to do with the stimulation of smooth muscle, blood pressure, water metabolism and pigmentation of the skin.

Ovaries and testicles in their endocrine function cause the development of sexual activity and secondary sexual characteristics. Associated with reduced gonadal activity are small carious teeth with stunted lateral incisors and cuspids. A marked increase in caries also accompanies puberty, pregnancy or the menopause.

These may seem like very dry facts but if we construct a case, you will see their practical importance. Should a person develop a tumor of the cells of the anterior pituitary which controls growth, he will, if his long bones are still capable of growth, grow to a tremendous height, or if he is older, his hands, feet and features will enlarge tremendously. His thyroid may be stimulated producing a goiter with its toxic symptoms. The blood sugar may be affected producing a type of diabetes. The tumor of these growth-stimulating cells may crowd out the other cells giving a deficiency in other hormones. In contrast to the above case, we may have a small pituitary gland producing dwarfism with childlike proportions and a lack of sexual development. They may grow two or three inches in a relatively short time, their proportions may change into those of an adult, and they may mature. Can you imagine any greater thrill than to look upon such a change that you have effected?

The endocrine gland about which we know most is the thyroid, best known to the lay person in its tumorous form as a goiter. This gland regulates the speed of the chemical processed that we determine in taking a Basal Metabolism test. The thyroid regulates a person's adaptation to his environment: i.e. his emotions and alertness. To use the extremes to illustrate—a person with increased thyroid activity as in a goiter will be very alert mentally and physically and highly emotional. He will be warm-blooded, for his circulation of blood is accelerated. His heart rate is increased and his blood pressure raised. Since all his processes are accelerated, he will be able, (to quote "Esquire") "to eat like a horse and stay thin, and drink like a fish and stay sober."

In contrast, the hypothyroid person is sluggish, phlegmatic, mentally dull, with coarse dry skin and hair, and generally obesity. If this condition has existed since birth, the child is mentally deficient unless treated constantly with adequate doses of thyroid. This type of mental deficiency is called Cretinism. The thyroid gland is one of the most important influences in dentistry. Thyroxin influences the laying down of embroyonic tooth buds, a subsequent eruption of teeth, and the consistency and life of teeth. Over stimulation of the thyroid causes early dentition. Sometimes the baby is born with teeth.

In hypothyroid states—known in infants as Cretinism—there is slow development and eruption of deciduous teeth and the permanent teeth may be delayed even to adult life. These hypothyroids have large central incisors, small lateral incisors, overlapping and crowding with mal-occlusion. There is poor calcification with severe cavities. The normal function of the thyroid causes the growth and development of perfect, white, properly spaced teeth.

The famous disease diabetes, is due to an endocrine deficiency; the lack of sufficient insulin. Insulin is the hormone produced by the Islands of Langerhans—little islands of endocrine tissue found embedded in the pancreas. In 1919 Banting and Best made their names famous and revered by isolating insulin. They are to be thanked, not so much for the number of lives they have saved as the number of lives they have made livable. Diabetes may first be suspected by the condition of the mouth. A diabetic's resistance to infection is low. He may, therefore, frequently have extensive caries, root abscesses, gingivitis, and stomatitis.

The adrenal glands are small masses of tissue surmounting each kidney. They have two portions, one which secretes adrenalin and one cortin. Adrenalin is a very powerful drug which stimulates all the nerves which express emotion. They produce the usual energy shown when in need of self-protection or in time of anger or fear. It is the drug which causes one's heart to pound or one's blood to curdle or one's hair to stand on end. Under the effect of this hormone, digestion ceases, hence the gastric upset due to nervous shocks, or the "nervous indigestion" in people who are always in an emotional state. The blood pressure is markedly raised by adrenalin. For this reason, Dr. Crile of Cleveland, has recently prescribed the removal of the adrenal glands for high blood pressure. The typical picture of an animal under the influence of the adrenal gland is a cat on a fence with his back arched and his hair standing on end. The whole cat family have relatively very large adrenals. Associated with a hyper secretion of the adrenals in animals and human beings are large canine teeth.

Cortin, the second product of the adrenal glands, has a very different role. It takes charge of salt and water metabolism and also has some relation to hair and pigment distribution in the body. It gives a person a sense of vitality. We know this in a negative way. The person suffering from a degeneration of the cortex of the adrenal gland has what we call Addison's disease. He has a profound weakness, low blood pressure, poor appetite, and a peculiar bronze pigment of the skin and mucous membrane. A tumor of the adrenal cortex produces in a woman, masculine characteristics—a heavy growth of hair on the body and a deep voice.

The parathyroid glands control the calcium and phosphorous metabolism of the body, therefore having a profound effect on bone and tooth development. A deficiency of parathormone reduces blood calcium causing muscular twitching and convulsions. It produces atrophic peg-shaped teeth with defective pitted enamel and a tendency to extensive caries.

An over-abundance of parathormone as in tumors of the parathyroid gland increases the calcium of the blood at the expense on the bones and teeth. Cystic areas of bone occur, especially in the jaw bones. There is

decalcification of the dentine, rendering cavities frequent and restorations difficult.

Rony, in an article on Endocrine Glands and Dentistry wrote. "The parathyroid plays a role of calcification of the dentine and enamel during the formative period of dentition. The poor calcification of the teeth found in infantile hypothyroidism and certain forms of hypopituitarism, is probably due to hypoparathyroidism associated with these conditions. After the teeth have attained their final size and structure, the enamel, and probably the dentine too, does not respond any more to change in parathyroid function. We cannot feel but that the internal secretions of the endocrines are important factors in the development of jaws and bones. There is decalcification of the dentine, rendering cavities frequent and restorations difficult. Many oral conditions may be the manifestation of endocrine disturbances. 'All dental abnormalities, especially delayed eruption, caries, mal-occlusion, decalcification and teeth resistant should be investigated from the endocrine viewpoint'. A cooperative program between the dentist and physician from this endocrine approach will result in an improvement in the dental health."

The rest of the endocrine glands have not yet been sufficiently studied to be able to more than theorize on their function.

One of the most hopeful vistas that Endocrinology opens before us is the solution to many psychiatric problems. Most physicians feel that little has been accomplished in treatment by the present day psycho-analytical approach. The anatomical approach has shown no marked difference between the brain of the insane and the sane. Dr. Foster Kennedy, a few months ago, in an article in the American Medical Association Journal, suggested the possibilities that Endocrinology offered to Psychiatry. We have seen that too much thyroid produces a highly emotional state and may in extreme cases give storms of delirium. Too little thyroid so dulls the mind and emotions that the severe case merely lives a vegetative existence. Thyroid has proved a specific drug for Cretinism and thus removed one form of mental deficiency from the ranks of the hopeless cases.

We know that an untreated case of diabetes may result in coma. Tumors producing too much insulin may give attacks of violence and unconsciousness when the blood sugar is lowered too far, just as when a diabetic takes too much insulin. These clinical cases of tumors of the Islands of Langerhans are rare and have only been described recently.

One of the most satisfactory cases to treat at present are the menopausal symptoms. In only the past few years had an adequate dose of ovarian hormone been given, and most dramatic results have followed. We now know that the nervousness, irritability, mental depression, headaches, dizziness, and hot flashes are all the result of gradually diminishing ovarian activity. No longer need the poor suffering patient be laughed away by doctors as neurotic. By merely a few injections of ovarian hormone, one can guarantee to make a patient feel like a new woman. (This sounds like an add for Lydia Pinkhams) I wish you could sit in our clinic and listen to our patients tell how remarkable an improvement they have experienced. In the more severe cases of depression which require hospitalization, called "Menopausal Melancholia", ovarian hormone is no less effective. In a

recent issue of the Journal of the American Medical Association, a series of cases were reported from a mental institution, and showed 93% cures.

You have all, doubtless read recently in the papers, of a new treatment for the so hopeless insanity—Dementia Praecox. A physician in Vienna has devised a method of producing daily insulin shocks for a period of weeks by injecting large doses of insulin into his patients. On recovering from these attacks, the patients show gradual and sometimes startling improvement. Actual cures have been reported.

With such a large and definite stride into the field of Psychiatry, I am sure Endocrinology is going to find the answers to many of our present impossible problems.

Of more practical importance to all of us who are students of human nature, no matter what our vocation, is the effect of endocrines on the make-up of the individual, on his stature, personality, and capabilities. Already the psuedo-scientists have perceived the human interest in this subject. In "Esquire", of a few months back, six outstanding types of women and men were sketched and classified. Many psychologists have elaborated on the endocrine types, describing their stature, coloring, probable tastes in vocations, hobbies, clothes, foods, etc. I attended a course given to social workers on just this subject. It was intended to make the workers more understanding in dealing with their clients, and more intelligent in placing them in appropriate occupations. Perhaps in some advanced system of education, the endocrine types will be separated and the subjects taught in a way to appeal to their separate tastes.

Of course, a little more concrete is the effect on stature and form of the various endocrine glands. In the treatent of obesity, it is important to be able to determine the exact glandular deficiency before specific therapy can be used. The deficient thyroid gives generalized obesity and can be readily recognized by the Basal Metabolism test. The hypopituitary has the heavy torso, heavy upper arms and thighs, with small dainty wrists, ankles, hands, legs and small features. Pituitary injections readily reduce this type. Ovarian deficiency gives buttocks and thighs out of all proportion to the rest of the body. Obesity is being recognized as an endocrine imbalance in which the hormones regulating fat, sugar and water metabolism are chiefly involved. There is a warning that should be sounded. All new ideas are ready toys for the quacks and charlatans to foist on the poor ignorant public. The medical world itself, knows so little about the subject, it cannot yet enlighten the layman. Hence, because of one dramatic cure, expensive endocrine gland products are foisted on people as a panacea for all ills. They are not only useless but dangerous. At present, only a physician with a complete knowledge of the whole subject, especially trained in the new laboratory methods of diagnosis should experiment with these forms of treatment.

As we stand on the threshold of a brand new field in medicine, the innumerable possibilities that may lie ahead stagger us. We have in our hands the substances that determine whether we shall be sluggish or keen, excited or depressed, thin or stout, dwarfs or giants, masculine or effeminate. Some of us who could perhaps be a few pounds lighter, or a few inches shorter, may justly say we have been born thirty years too soon.

Program of Dental Division Pennsylvania State Department of Health

Prepared by DR. MILTON J. WAAS, *Chief, Dental Division*

IN drawing up the present plan of the Dental Division of the Pennsylvania State Department of Health, we have endeavored to make it as inclusive as possible of all the necessary features for a comprehensive public health dental program. Not being unduly optimistic we have called it our "Thirty Year Plan".

It has been just thirty years since the Pennsylvania Department of Health started its active Anti-Tuberculosis program. During that time the incidence of tuberculosis has been reduced by two-thirds. If we can reduce the incidence of dental caries a like amount in the next thirty years, it will have been well worth while. We have, therefore, modeled our program, in as far as is possible, upon the other successful one.

1. Placing dental health definitely in the Public Health field.
2. Proper ethical publicity.
3. Education—a definite teaching program approved by the Pennsylvania Department of Public Instruction.
4. Inspection.
5. State notices to parents of all children in need of dental corrections.
6. Dental Prophylaxes.
7. Dental Corrections.
8. Exhibits.

As many of these steps are intimately correlated and often interlocking, it will be impossible to discuss each separately but a word picture of the plan at work will explain much of what we are attempting.

Under the Maternal and Child Health Provisions of the Federal Social Security Act, the Dental Division in the Pennsylvania Department of Health employs at present eleven dental hygienists, one acting as supervisor.

This plan was inaugurated in June, 1936 and under Federal regulations is confined to rural communities of not more than 5,000 population. In as far as is practical, the time is evenly divided between pre-school and school work. Pre-school work is done in the summer months and school work during the school term. Since inception, work has been done in twenty-five counties. These have been chosen on a basis of apparent need, requests received and estimated cooperation to be received.

The routine used in the school program is as follows: Consent from the County Superintendent of Schools must be obtained before the work is begun in each county. The dental hygienists have always been given this consent so far and have received thorough cooperation from the County Superintendent's office in each case. The County Medical Director, State Nurse, Dentists, School Board members, Parent-Teacher representatives are all contacted and the program and purpose of our work explained to them. The local newspapers are contacted and have generously

given publicity to the program and its purposes. The actual work in the schools consists of a thorough examination of all children enrolled in the first eight grades. Each child found in need of any dental attention is given a State Corrective Advice Card. One side advises the parent or guardian that the child should visit their dentist. The other side is for the dentist to sign and is to be returned to the school teacher by the child, stating that the necessary work has been completed. Each teacher is requested to save the returned cards and forward them to the local County Superintendent's office. At a later date, visits are made to this office to collect the cards From these, data concerning the progress of the work is compiled. In each of the first three grades some prophylaxes are given. In each class room, at least one period of dental health instruction is given. Our Daily Diet Guide is given to each child with careful instruction on same and taken by them to the home. This card is very simple and has received the endorsement of the greatest American authorities on diet. Home visits are made when the dental hygienist considers the case specially urgent.

Standardized Dental Health addresses are given to the local service clubs, Parent-Teacher meetings and any other interested groups. In these addresses, we stress the need of healthy parents if they would have healthy children; that healthy children with a good diet usually have good teeth. The prime importance of diet both for parents and children is pointed out, also; the pre and post-natal significance of this factor. That dental caries is not the dentist's fault, but the child's misfortune is made clear. Further, it is shown that financial inability to pay for dental corrections needed is just an added misfortune. Hospitalization of the indigent ill, care of the insane, crime prevention and jailing of the criminal are recognized as local social problems.

Likewise, it becomes a local social problem to raise funds to at least pay the material expenses for this needed work to the local dentists, who usually are perfectly willing to meet the problem half way by giving their knowledge, time and equipment to this desired end. It is explained that funds so expended are a direct investment in the future health and welfare of the future citizens of their community. In such manner, in many instances, sums sufficient to pay for all corrections are arranged.

The value of the teeth, the value of a clean mouth, how and when to brush the teeth, how to care for the toothbrush and the formation of good health habits, the value of periodic visits to the dentists and the general health value of perfect teeth are all stressed.

Along with this special instruction, there is built up a background of knowledge, appreciations and attitudes toward health. Individual attitudes become classroom attitudes and prevention becomes a reality. This is not theoretical—it is demonstrable.

The teachers, principals, school board members and county superintendents are given a complete report of the work in each school. In several localities, the result of our program has been the employment of a local dental hygienist for the following school year. As we now have a teacher tenure law in Pennsylvania, this means a permanent dental program in the schools where a dental hygienist is employed by the School Board.

The routine used in the pre-school work is as follows: Arrangements for the pre-school clinics are made in advance with the County Superintendent, State Nurse and Parent-Teacher groups. The local authorities have been permitted to make their own schedule for the clinics. The time, place, appointments and transportation for the children and mothers are arranged before the dental hygienists begin their work in the county. Each child receives a prophylaxis and the mothers are given the opportunity to watch the procedure. The dental hygienist explains to the mother the importance of the deciduous teeth; cautions her to watch for the eruption of the six year molar; why the six year molar is important; advises early visits to the dentists, and in general, instructs the mothers in all phases of dental health.

We find that many parents are as much in need of dental education as their children. Other printed educational material is given to parents and children.

A number of educational movies are available at all times and this feature is being rapidly added to. By the time our two or three dental hygienists, working as a unit, have completed their work, they leave the town very much "tooth conscious".

A weekly dental educational article is prepared by the Chief of the Dental Division and is at present appearing in about forty newspapers throughout the state.

In July 1935, an Act was passed by the Legislature providing for the purchase and distribution of vitamin products by the Department of Health to the various school districts for distribution therein by the teachers. This was distributed on the basis of those under-privileged pupils found, after medical examination, to be in need of these accessory food factors. The basis was usually those around thirteen per cent or more under-weight. A very thorough going scientific investigation is under way in one school district to arrive at a thorough valuation of the value of this work. This has been under the supervision of a dentist and the State Dental Society of Pennsylvania contributed funds to the work.

Each year, a dental educational exhibit is given at the State Farm Show. This year the attendance was about 473,000.

An exhibit is planned for the A.D.A. meeting for this year.

Another permanent feature of the dental program is the employment of certificated graduate dental hygienists by the local school boards throughout the State. There are at present about 145 so employed. Their procedure is much the same as that outlined for those employed by the Maternal and Child Health hygienists, except that they have the opportunity to devote their entire time to one district and, therefore, are able to be much more intensive and systematic in their efforts. They give prophylaxes to all the pupils not already under the care of their own dentist and have regular systematic class room periods. For these hygienists, the Division has supplied a complete set of Socialized Activity Units for teaching and a partial set of graded teaching outlines. This latter will soon be com-

pleted. A very complete monthly report card of work and detailed findings of their examinations must be mailed into the Capitol headquarters. In this way, valuable data can be obtained on the progress of the work and evaluated. During the past year, thirty per cent of all the children examined have received dental corrections of defects noted.

Many of the school boards have employed one or more dentists and have set up school clinics to care for all the under-privileged children of their school districts. As dental caries is a constantly recurrent disease, such corrections are necessary and valuable, but are not fundamental to the progress of dental prevention. The slogan adopted by the Dental Division is

"All dental prevention occurs through Education".

This is the reason we have elaborated upon the role of the dental hygienist in the work of prevention. The natural habitat for a child to learn is in the school room and dental instruction should be received there. We cannot expect dentists to start at a primary teacher's salary of $1,000.00. Moreover, a dentist is not trained as a teacher.

In Pennsylvania, we have constantly striven to elevate the terrain of the dental hygienist from the mouth to the mind. We contemplate a material increase of the educational requirements of the dental hygienists to better fit her for her teaching career. A handbook of Dental Educational Elements for distribution to each of the 40,000 school teachers in Pennsylvania is projected. This will be issued as a separate supplement to the General Handbook of Health Education issued by the State Department of Health. This, to our minds, is the only way we can ever hope to expeditiously affect the education of our two and one-half million Pennsylvania school children.

However, we must be alert to see that the direction and supervision of all these plans must be retained by the dental profession. As dental caries and all the infections arising therefrom have their initial onset in the enamel, there can **never** be any serological immunity or treatment established, as enamel is a tissue without any circulation. Therefore, the slogan "All dental prevention comes through education" is sound.

Vacations

BY THELMA MYERS, R.D.H.
Cleveland, Ohio

WHAT does the word "vacation" bring to your mind? Does it mean to you a well-earned holiday, a much needed change in scenery, surroundings or people?

In planning a vacation a person should take into consideration their present occupation so they can plan a type of diversion from their everyday life. A traveler would seek a quiet secluded place: a cottage by the water, a cabin in the mountains, or perhaps a week or two on a dude ranch.

Persons whose daily work follow the usual stereotyped office routine would most naturally crave excitement of the nature that can be found in traveling. For variety, one might take a trip to Cuba. In order to include several modes of traveling, take a train to New York, and steamer down the East Coast to Cuba. If you would plan the return trip by airplane, this would allow you to spend a longer time on the island.

Country people seek the city. It is advisable to urge each one to learn the wonders of the larger cities in their State. This has a tendency to develop a better understanding for the "city cousin", and a feeling of harmony in legislative matters of state-wide interest.

The inhabitant of the city has been busy in the winter months keeping the proverbial wolf from the door. The first sign of spring breaking forth in her enchanting raiments lures the pent-up townsfolk to the country to see the wonders of "mother earth".

The individual occupied in guiding students through the channels of the various institutions of learning find it profitable to plan trips of an intellectual nature.

The most important phase to consider in planning a successful vacation is choosing a congenial, interesting traveling companion. Many trips have been ruined by the hasty choice of a partner.

Since the average hygienist knows of the interests of her State, she usually plans to go afield for her vacation. With this thought in mind, allow me to suggest the advantages in planning to attend the National Dental Hygiene Convention at St. Louis, Missouri, October 24th to 28th inclusive.

To attend the convention will prove extremely interesting and worth while to all dental hygienists for the following reasons:

(1) professional stimulation
(2) comparison of interstate hygiene problems
(3) support of your delegate
(4) opportunity to learn how the meetings of the American Dental Hygienists' Association are conducted
(5) a chance to hear the most outstanding men in the dental profession
(6) to renew friendships of your classmates
(7) to create better fellowship and understanding between the dentists and dental hygienists.

Again let me urge you to attend the National Dental Hygienist Convention at St. Louis, Missouri.

Porcelain Inlay Technique Without the Use of a Platinum Matrix

BY JANE ROSECRANS, R.D.H.
Chicago, Ill.

Presented as a part of a clinic by the author at the Mid-Winter meeting of the Chicago Dental Society.

THIS technique of porcelain inlays is a simple method, fusing the porcelain directly in the investment models without the use of the platinum matrix.

The impression is taken by moulding the end of a small stick of modelling compound to a point, heating it and pressing it into the cavity. After the impression is taken, the excess compound is trimmed away and a contra-angle bur is inserted about one quarter inch down on the base of the modelling compound. A piece of sticky or masking tape, about one-fourth inch wide and one and one-half inches long is made into a ring to form the base for the investment material.

The Ransom and Randolph Porcelain Investment is used because it withstands the intense heat and will not become soft and crumble. The investment is mixed with water to a thin mix and painted on the impression. The excess is blown off and vibrated by using a serrated instrument on the bur. More of the powder is added to form a putty-like mix and this is added to the impression. First make sure of vibrating well. The ring is then filled and the impression is inverted on it. After this has been allowed to set for fifteen or twenty minutes, dip into hot water to remove the modelling compound, pull off the tape and trim the overhanging edges.

A matrix band is placed around the investment model and inserted in the matrix holder. Be sure that the model is well saturated in water and the excess is blown off. If the model is not saturated, the porcelain will absorb into the investment. The porcelain is mixed to a creamy mixture and applied just a little at a time to the base of the cavity, vibrating the matrix holder. Take a dry piece of gauze and absorb the moisture through the investment. Keep adding more of the porcelain as the moisture leaves until the cavity is filled to a slight over-contour. Be sure to vibrate continually while you are adding the porcelain, so as not to incur bubbles. The cavity is over-filled to compensate for the shrinkage of the porcelain in baking. If the porcelain has over-flowed the margins, the excess must be taken off. This can be done with a fine camel's hair brush. The porcelain is now ready for the first bake. The matrix is removed and the model allowed to bake, gradually increasing the heat to about one hundred degrees below the fusing point of the porcelain and holding it at that temperature for three minutes. The porcelain should not noticeably pull away from the margins.

The model is again placed into the matrix holder, dipped in water and more porcelain is added as before; building to an over-contour. This bake is run up to its full fusing point of the porcelain, 1875 degrees F and

kept at this heat for about two minutes then allowed to cool gradually. For larger inlays, three bakes will be necessary. Do not overbake as this will burn out the color and reduce the strength of the porcelain.

An alcoholic solution of methylene blue can be painted on the investment model to aid you in seeing the margins. The porcelain powder can be easily seen on the blue and be brushed away.

Wet the model and break away the investment from the inlay. Set it with either Kryptex cement or synthetic. The regular cement will not give the opaque translucency as the other two.

Each porcelain oven should have its fusing point established. The electric current is not always steady and the pyrometers vary. Some furnaces run faster. In this case a higher temperature is required and if it is slower, the full glaze of the porcelain will be reached at a lower temperature.

BOOK REVIEWS

PRACTICAL PEDADONTIA or JUVENILE OPERATIVE DENTISTRY and PUBLIC HEALTH DENTISTRY

By Floyde Eddy Hogeboom, D.D.S., F.A.C.D. Professor of Children's Dentistry, College of Dentistry, University of Southern California. Former Member Health and Development Department, Pasadena City Schools. Former Member of Children's Hospital Staff, Los Angeles Consultant to Orthopedic Hospital, Los Angeles. Chairman, Dental Course, Los Angeles Junior College, Los Angeles 1930-37. Published by the C. V. Mosby Co., 3525 Pine Blvd., St. Louis, Mo. Price — $6.50. Every dental hygienist, regardless of her field of activity, should ever be on the alert to learn the newer methods and procedures that will increase her efficiency and make her more valuable to her employer.

Dr. Hogeboom's book you will find most interesting and most instructive. In his second chapter, he treats the subject of Child Management in the Office and follows unexpectedly with a chapter on "Mental Hygiene Viewpoints on the Child". This is particularly good since so seldom are these two subjects related when in truth, they are inseparable. His following chapters on Embryology will serve to refresh your memory but those on Preventive Dentistry will reveal information that should be of value in your daily work. Finally, his chapters on Public Health Dentistry, conveying suggestions to those associated with this new activity.

BACTERIOLOGY FOR DENTAL Students

By Arthur Bulleid, L.R.C.P. (Lond.), M.R.C.S., L.D.S. (Eng.). Dental Surgeon and Lecturer in Special Bacteriology to the Dental School,

Guy's Hospital. Published by C. V. Mosby Co., St. Louis, Mo. with 24 plates, one of which is colored, and 36 Illustrations in the Text. Price $4.75

In years past, little importance was attached to the relation of dental to systemic diseases, but the past quarter of a century has brought to light so many new facts that dentists who never before dreamed of examining a specimen are doing so now, and many times in their own offices. The dental hygienist who can make the necsssary preparations for such examinations proves herself in another way, useful to her employer.

Notwithstanding the course in Bacteriology that was part of our training, many of us still are unable to function in this capacity as well as we might with more extensive training and study.

Bacteriology for Dental Students may readily be used by the dental hygienist. Perhaps you are already familiar with part of the text but much of it is new to our profession. But, easily followed, it may be used as a textbook by any one of us.

The Biology of Bacteria, followed by a chapter on Methods of Sterilization will serve as a "refresher course" but those devoted to preparation of stains for microscopic use; the preparation of media for cultural purposes and finally methods of isolation are more or less new since our initial introduction was limited. Three latter chapters are devoted to conditions of the mouth, therefore, of greater value as an immediate interest.

Hodgden-Shell Dental Materials

By John S. Shell, B.S., M.A. Director of Research and Development, Thomas J. Dee & Co.; Formerly Assistant Professor of Chemistry and Metallurgy, College of Dentistry, University of California. Published by C. V. Mosby Company, St. Louis, Mo. Illustrated. Price $4.50.

Many a dental hygienist employed in private office work today, is found fulfilling the duties of office assistant and secretary as well as that for which she was trained. For this reason, she should keep in mind that insofar as her employer advances in newer methods, so must she. If doing laboratory work as well, she will find it much more interesting when she knows more of the nature of the materials with which she is working.

Mr. Shell's book in this event will prove most helpful since it gives one all such information and is not too difficult for one who has been associated with a dentist for some time. For one who is new, it will require more careful study but will in time enable her to listen as well as speak intelligently upon such subjects.

His first chapter explains the chemical properties of various metals while the following chapters take up the various dental materials individually. The book should prove of great value to many of our readers.

Lesson on Dental Anatomy and Tooth Decay

BY HARRIET M. FITZGERALD, A.B., *Instructor in Dental Hygiene*
University of California College of Dentistry
Dental Hygienist, Berkeley Public Schools

Lesson suitable for grades four, five, and six.

Materials needed:
1. Crayons, red and yellow.
2. Mimeographed sheets with outline of six-year molar. (See attached copy)
3. Pencils.

Instruction technique

A. The Mimeographed sheet is given out. The dental hygienist tells the children to take their rulers and draw four or five lines across the blank side of the paper for some sentences. She then writes the following on the blackboard and tells them to copy it. (In the seventh, eighth, and ninth grades the sentences could be dictated.)
   1. THIS IS A CROSS SECTION OF A LOWER SIX-YEAR MOLAR.
   2. THE SIX-YEAR MOLAR IS A PERMANENT TOOTH
   3. I SHOULD HAVE FOUR SIX-YEAR MOLARS.

B. The paper is then turned over and the following instructions are given:
   1. Color the pulp or, as it is commonly called, the nerve, **red.**
   2. The Dental Hygienist holds the paper up and asks the question, "Where is the pulp or nerve?" answer, "Center section." Dental Hygienist, "Color it red."
   3. Color the dentine yellow. (That is the part next to the pulp which is in the center.)
   4. The outside covering, the enamel, is not colored and remains white.
   5. Color the gums, **light red.**

C. Label each part with pencil including the roots, gums, enamel, dentine, and the pulp. An arrow should point to each. (Dental Hygienist illustrates these directions by drawing on blackboard and labeling parts.)

D. After the labeling is completed, have the child take his red crayon and put narrow red lines from the pulp to the dentine. Explain to the children these lines represent nerves.

Discussion technique

A. Some cavities can be filled with little or no pain. This is because the cavity is very small and is only in the enamel.

B. When cavities hurt when the dentist is filling the tooth, it is an indication that the dentine has been penetrated by the decay. The small nerves in the dentine cause this feeling.

C. When cavities are painful as soon as the dentist touches the tooth, it is an indication that the cavity is already in the dentine. Preceding the dental visit there may have been evidence of sensation when something hot or cold or sweet was eaten.

D. When the tooth aches and the face has become swollen, it is an indication that the decay has probably reached the pulp. If the decay has, the pulp dies and the tooth becomes abscessed. Extraction is usually the end result.

E. This entire process of decay reaching the pulp can be prevented by the detection of small pit cavities through regular periodic examinations by a good dentist or dental hygienist and the filling of these cavities by the dentist when they are in the enamel.

F. Other factors in addition to regular dental care are necessary in order to insure one of good dental health. These factors include adequate nutrition and mouth hygiene.

Note: If it is possible a dental examination by a dentist or a dental hygienist should be made prior to the giving of this lesson. At the conclusion of this lesson the names of those who have good teeth can be read aloud to the class and they will write on their mimeographed sheet the following:

MY SIX-YEAR MOLARS ARE GOOD.

Those children with defects in their six-year molars will write:

MY SIX-YEAR MOLAR HAS A CAVITY.

(The dental hygienist or dentist will then outline in pencil the cavity and the child is instructed to color it brown and label it "cavity".)

Discussion

A small cavity in the enamel doesn't hurt and one wouldn't know it was there until the dental examiner told him. A larger cavity can be felt with the tongue. A still larger cavity hurts when one eats hot, cold or sweet foods.

Comment

One usually will find that this type of lesson will result in dental correction being made. The child should be required to take this mimeographed sheet home with him to show his parents.

Bridgeport High School Plan

BY MABEL MCCARTHY, R.D.H., *Bridgeport, Conn.*

Supervisor Dental Hygiene, Division Board of Health

WHENEVER a group of dental hygienists engaged in public school activities assemble to discuss their problems and programs, the question invariably arises, "How are we to keep the intermediate group of pupils interested in dental hygiene?"

We can keep the younger group interested by offering CLEAN TEETH pins, DENTAL HONOR ROLL buttons and various other awards.

Here we might enter into a lengthy discussion as to the merits and moral effect of awards and competition in education. However, there seems to be as many in favor as opposed to this practice. There is much to be said on both sides of the question.

The older (high school) student has reached a stage where he is interested in his personal appearance. In all probability there is a girl in the class in whom he is interested and he wishes to make an impression, or he realizes that a healthy body is dependent to a great extent upon a healthy mouth.

Now comes our problem, THE INTERMEDIATE GROUP.

Those of this group very often feel that toothbrush drills, daily checking of mouth hygiene, talks on personal health and habits, awards of pins, buttons, etc. are for the younger group and they have outgrown such childish practices.

How often do we hear the remark from dental hygienists, "The pupils of this age think they are in the sissy class if they admit carrying on these personal practices."

In the Bridgeport Connecticut public schools, this problem has been worked out satisfactorily. Every student who anticipates engaging in any type of high school athletics is required to pass a rigid physical examination. These examinations are given by the school doctors. The local Health Officer, Dr. Richard O'B. Shea, has passed a rule to the effect that no student may present himself for a physical examination until he has first obtained a signed certificate from his dentist stating that all necessary dental work has been completed. This means the teeth must be clean, all cavities filled and all abscessed, diseased teeth extracted.

Twice a year a notice is sent from the offices of the Health Officer to all junior high schools requesting principals to advise pupils of this requirement in order that they may be prepared to meet it on entering the high schools. This impresses upon the pupil the importance of dental health and the dangers of dental disease. The school dental hygienists

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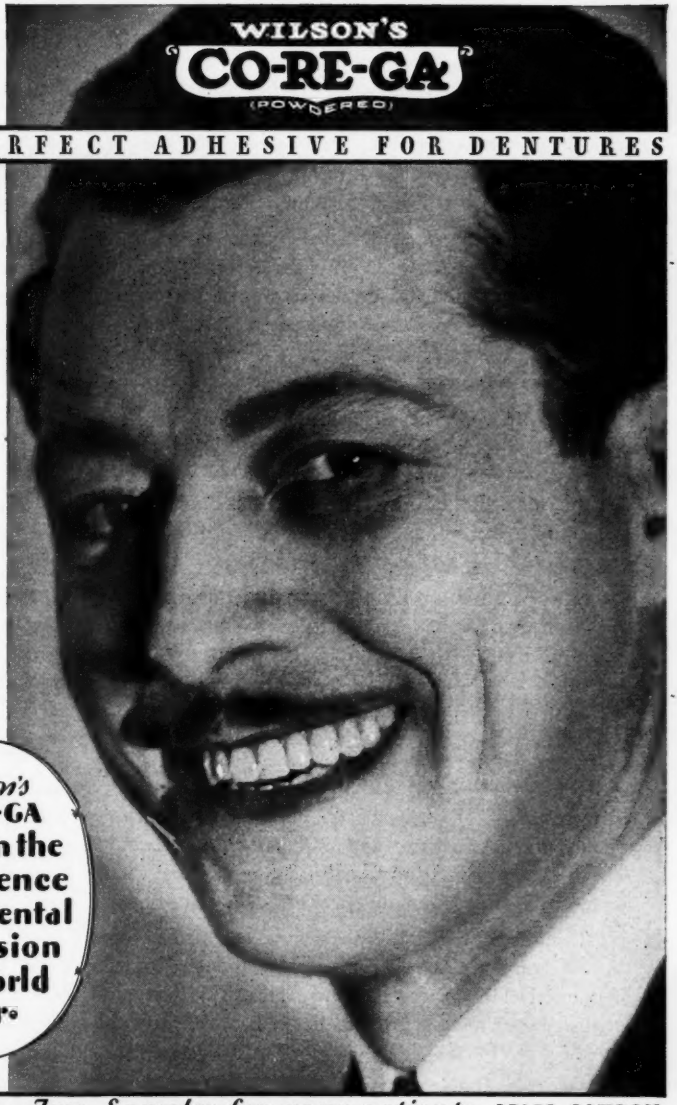

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stress this requirement in the class rooms. They impress upon the student the danger of permanently injuring his health by excessive physical exercise in the event that dental disease is present. The results have been most gratifying.

In September one group of sixty-two boys from the Warren Harding High School applied for physical examinations for football squad. Sixty of these students presented signed dental certificates when they appeared for physical examinations. The other two boys had minor dental defects and were given a short time to have them corrected.

This procedure has taken dental hygiene out of the "sissy" class and placed it in the "hero" class. The sixth, seventh and eighth grade boy who dreams of making the high school football squad takes his toothbrush drill and his dental health as seriously as the first grade boy who is working for a button and to have his name placed on the dental honor roll, or the high school boy who now realizes the true value of dental health.

This plan has worked out so successfully in Bridgeport, Connecticut, that it might offer a suggestion to communities that are confronted with a similar problem.

NEW EVENING COURSES

Dr. Alfred John Asgis, instructor in oral surgery at the New York University College of Dentistry and author-lecturer on problems of dental science, will conduct two new non-credit evening courses emphasizing the role of dentistry in public health service during the fall term beginning September 19th at the University's Washington Square center.

Designed for dentists, physicians, technicians, nurses, social workers, and others interested in social dentistry, the new courses will be "Essentials of Public Health Dentistry," and "Health Security and Social Aspects of Dentistry." The courses will be sponsored jointly by the University's College of Dentistry and the Division of General Education.

Dr. Allen T. Newman, dean of the College of Dentistry, said that the new courses, believed to be the first of their kind offered at an Eastern university, are being inaugurated "to meet the need felt by many busy professional men and women for a better understanding of the latest developments in the increasingly closer relationship between the science of dentistry and the public health service, and of their own place in that movement.

"Dentistry in America is rapidly ceasing to be merely a technical, private affair of interest only to the dental or medical profession. Because the public is demanding more adequate dental service for the great masses of people, it is important for those scientifically trained to give such service

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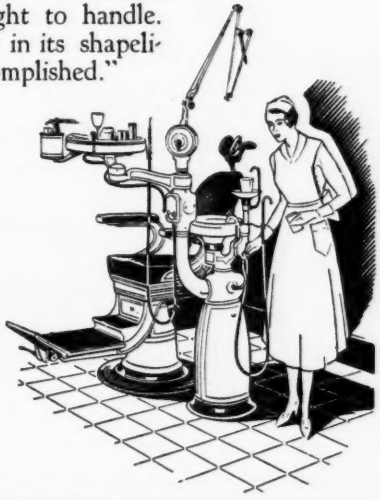
You will find it in dental operating rooms and laboratories wherever dentistry is practiced — on dental operating chairs, units, instruments, cements, porcelains, amalgam alloys, precious metals, numerous appliances; in fact, on almost everything used in a dental operating room and laboratory.

It is on instruments perhaps that it will mean most to you. Not very long ago an eminent dentist while speaking to a group of fellow practitioners said, "To find a new instrument which will enable us to do easily what we could never do before does as much good as acquiring some coveted old book, some rare bit of china, or a valuable print—it enriches our practice. Here is such an instrument—an S. S. White Tarno No. 1. I do not hesitate to call it perfect. Note the poise of the whole instrument, the angles at which the blades leave the shaft, the tapering end, the beautiful finish, so that it is a delight to handle. There is a touch of genius in its shapeliness. Here is the quest accomplished."



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to develop a synthesis of the public and professional viewpoints which will be functionally suited to modern American conditions. That is the objective of the two courses which will be given by Dr. Asgis."

The lecture-discussions in the course in "Essentials of Public Health Dentistry" will deal with the growth of preventive dentistry in the United States, preventive dentistry in the field of public health, the contributions of dental science and nutrition to community dental services for children and adults, agencies and personnel requirements for public health dentistry, and related problems. The social and economic phases of dental public health and the principles of dental health education will be emphasized.

The functions and significance of health security in the United States and health insurance systems in European countries will be considered in the course in "Health Security and Social Aspects of Dentistry." Problems discussed will include the distribution of dental and medical services in the United States, provisions for public dental and medical care, private practice in relation to group practice and pay clinics, and the protection of the quality of oral health service. Analysis will also be made of the principles, structure, and function of systems for health insurance and state medicine; the standard of living of dentists, physicians, and other personnel under health insurance programs; and experiments and proposals for wider distribution of health services to the American people.

Guest lecturers will address each group. Among them will be Dean Newman, Dr. Alfred Walker, professor at the New York University College of Dentistry and a member of the New York State Board of Dental Examiners, and Dr. William J. Gies, professor at Columbia University College of Physicians and Surgeons and director of the Carnegie Study of Dental Education.

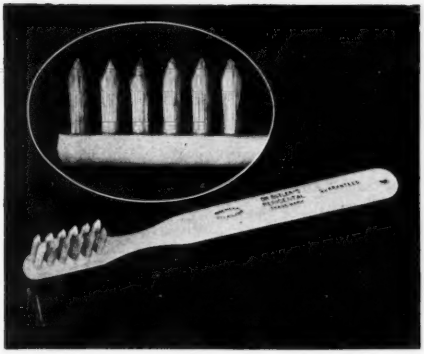
Dr. Asgis is an assistant visiting dental surgeon at Bellevue Hospital as well as a member of the faculty at the New York University College of Dentistry, where he received his D.D.S. degree in 1918. In 1936 Dr. Asgis inaugurated in the University's School of Education the first program for training of teachers for dental college.

DENTISTS ATTENTION!

The part that organized dentistry will play in the recently proposed plans for a government program of health for the American people may largely be determined by decisions made by the American Dental Association membership at the annual sessions to be held in St. Louis, Mo., October 24th to 28th.

It is urgent that every member who possibly can attend be present at the St. Louis convention.

Never before has dentistry needed so keenly the opportunity for all shades of opinion in the profession to be freely expressed so that the best



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decisions may be made on this important question. The St. Louis convention offers this opportunity and none of us should fail to grasp it.

In the forefront of discussion in the House of Delegates at St. Louis undoubtedly will be the broad national health program recommended by the technical committee of the Inter-Departmental Committee to Coordinate Health and Welfare Activities. The program is patterned after the $850,000,000 plan submitted to the National Health Conference in July, at which time Dr. Camalier headed a delegation of dentists who were among the 300 medical, labor, farm, social work and civic leaders in attendance.

While the discussion on the government health project looms as the most important single problem to come up at St. Louis the five-day convention program is literally packed with events of vital interest to all members.

Three general meetings will be held—on Monday, Tuesday and Thursday evenings. At the Tuesday meeting, the national awards will be made to the fifteen best posters submitted in the great Dental Health Poster Contest. At the Thursday meeting, a symposium will be held on the past, present and future of preventive dentistry.

Throughout the sessions, every phase of dentistry will be covered in section meetings. Section officers have promised outstanding presentations in operative dentistry, materia medica and therapeutics; full denture prosthesis; partial denture prosthesis; oral surgery, exodontia and anesthesia; orthodontia; periodontia; children's dentistry and oral hygiene and histology, physiology, pathology, bacteriology and chemistry.

In addition, over 400 table clinics covering all phases of dentistry will be given on Thursday afternoon, Friday morning and Friday afternoon.

The Scientific and Health Exhibit alone would be worth the trip to St. Louis from any part of the country. More than 30,000 square feet in the magnificent St. Louis Municipal Auditorium will be occupied by 125 exhibits depicting the March of Progress in Dentistry.

"Youth Lane" will hold a prominent position in the hall of exhibits. Here more than 5,000 dental health posters—winners in the state and component society finals of the national contest—will be displayed.

Commercial exhibits at St. Louis appear to be the largest and most pretentious array in the history of the Association. Firms in the dental and allied fields will display a complete line of products and services.

The entertainment committee has seen to it that every spare moment at the convention will be enjoyable. High mark of the entertainment, of course, is the colorful President's Ball which will be held on Wednesday evening.

The St. Louis committee on arrangements, anxious for all members to be accommodated in the convention city according to individual requirements, has requested that those who have not already made reservations immediately write to the A.D.A. Field Secretary, Miss Charlotte Becraft, Room 108 Statler Hotel, St. Louis, Mo.

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